

In the Claims

Please replace all prior versions of claims in the application with the following list of claims:

1. (Cancelled)
2. (Currently amended) A method, as claimed in claim 24 further comprising using an inherent property of the received DMT signal~~signal~~, wherein part of the signal is correlated, in the time domain, in terms of cyclic extensions.
3. (Currently amended) A method, as claimed in claim 24 further comprising estimating the time mis-alignment of ~~the cross-talk signals as~~components of cross-talkers from the distance between the correlation maximum corresponding to ~~the~~a desired signal (known location) and other correlation maxima.
4. (Currently amended) A method, as claimed in claim 3 further comprising the step ~~wherein the amplitude of a correlation maximum is a relative measure of the power of the corresponding cross-talker~~of estimating the relative power of a corresponding cross-talker from the amplitude of a correlation maximum.
5. (Currently amended) A method, as claimed in claim 3 further comprising the step wherein, when a time offset of ~~the cross-talk~~ components of a cross-talker is estimated at ~~the~~a VDSL Transceiver Unit-Optical Network Unit (VTU-O), ~~this information~~the time offset is used to adjust its clock and frame boundaries to align with the cross-talker and hence orthogonality is achieved and distortion is minimized.
6. (Currently amended) A method, as claimed in claim 3 further comprising the step wherein, if ~~the~~an auto-correlation peak amplitude of ~~the~~a cross-talk ~~signal~~component of a cross-talker is low, ~~the~~a VDSL Transceiver Unit-Optical Network Unit (VTU-O) can choose to not

align clock and frame boundaries since the cross-talker then does not significantly contribute to distortion and hence a threshold level is used.

7. (Previously presented) A method, as claimed in claim 24 wherein the method can be used for applications including Near End Cross-Talk (NEXT) cancellation algorithms and multi-user detection algorithms.

8. (Currently amended) A method, as claimed in claim 24 wherein, when the method is used in every starting-up modem in the telecommunications transmission system, all modems that cause interference in each other's receivers become aligned to the same frame timing.

9. (Currently amended) In a communication system having a transmission channel, a method comprising ~~aets~~steps of:

a) receiving a carrier signal on the transmission channel, wherein the carrier signal is part of a Discrete Multi Tone (DMT) modulated carrier signal, wherein the DMT modulated carrier signal includes cyclic extensions, and wherein the cyclic extensions include a cyclic prefix appended to the beginning of the DMT modulated carrier signal and a cyclic suffix appended to the end of the DMT modulated carrier signal;

b) applying an autocorrelation function to the carrier signal to generate a correlation signal, further comprising applying an autocorrelation function to the DMT modulated carrier signal using a delayed copy of the DMT modulated carrier signal in order to correlate the cyclic extensions of the DMT modulated carrier signal;

c) detecting correlation maxima of the carrier signal and correlation maxima of a crosstalk signal in the correlation signal;

d) determining a time misalignment between the carrier signal and the crosstalk signal based on a time shift of the correlation maxima of the carrier signal and the crosstalk signal; and

e) adjusting a frame timing of the carrier signal based on the time misalignment.

10.-13. (Cancelled)

14. (Currently amended) In a Very high bit rate Digital Subscriber Line (VDSL) communications system comprising a plurality of modem pairs, each modem pair including a first VDSL modem and a second VDSL modem, the method comprising:

a) using the first VDSL modem of a first modem pair of the plurality of modem pairs to send a first discrete multitone (DMT) signal over a first transmission channel in a cable;

b) using the first VDSL modem of a second modem pair of the plurality of modem pairs to send a second DMT signal over a second transmission channel in the cable, wherein each DMT signal includes a DMT modulated carrier signal, wherein the DMT modulated carrier signal includes cyclic extensions, and wherein the cyclic extensions include a cyclic prefix appended to the beginning of the DMT modulated carrier signal and a cyclic suffix appended to the end of the DMT modulated carrier signal;

c) using the second VDSL modem of a first modem pair to receive the first DMT signal on the first transmission channel, the first DMT signal including a crosstalk from the second DMT signal;

d) applying an autocorrelation function to the first DMT signal to generate a correlation signal, further comprising applying an autocorrelation function to the DMT modulated carrier signal using a delayed copy of the DMT modulated carrier signal in order to correlate the cyclic extensions of the DMT modulated carrier signal;

e) detecting, in the correlation signal, correlation maxima of the first DMT signal and correlation maxima of the crosstalk from the second DMT signal;

f) determining a time misalignment between the first DMT signal and the crosstalk from the second DMT signal based on a time shift of the correlation maxima of the first DMT signal and the correlation maxima of the crosstalk from the second DMT signal; and

g) adjusting a frame timing of the first modem of the first modem pair based on the time misalignment.

15.-18. (Cancelled)

19. (Currently amended) In a communication system having a transmission channel, an apparatus comprising:

a) means for receiving a carrier signal on the transmission channel, wherein the carrier signal is part of a Discrete Multi Tone (DMT) modulated carrier signal, wherein the DMT modulated carrier signal includes cyclic extensions, and wherein the cyclic extensions include a cyclic prefix appended to the beginning of the DMT modulated carrier signal and a cyclic suffix appended to the end of the DMT modulated carrier signal;

b) means for applying an autocorrelation function to the carrier signal to generate a correlation signal, further comprising means for applying an autocorrelation function to the DMT modulated carrier signal using a delayed copy of the DMT modulated carrier signal in order to correlate the cyclic extensions of the DMT modulated carrier signal;

c) means for detecting correlation maxima of the carrier signal and correlation maxima of a crosstalk signal in the correlation signal;

d) means for determining a time misalignment between the carrier signal and the crosstalk signal based on a time shift of the correlation maxima of the carrier signal and the crosstalk signal; and

e) means for adjusting a frame timing of the carrier signal based on the time misalignment.

20.-23. (Cancelled)

24. (Currently amended) A method for keeping Discrete Multi Tone (DMT) frames aligned to ~~the~~ a same frame timing, for use in a telecommunications transmission system using a DMT system as a multicarrier system and having at least two Very high rate Digital Subscriber Line (VDSL) systems, each comprising a pair of modems, said at least two VDSL systems belonging to a single binder group common to both VDSL systems, comprising the steps of:

a) effecting a correlation between a received DMT signal comprising DMT symbols, each DMT symbol having cyclic extensions, and a delayed copy of the received DMT signal;

b) detecting correlation maxima which determine the frame boundaries of different DMT cross-talk components of the received signal;

c) estimating the time mis-alignment from the correlation maxima; and

d) using the estimate by the modem of the pair of modems to synchronize its own frame timing to a main cross-talkers frame timing.